

WHAT IS CLAIMED IS:

1. A semiconductor optical modulator having a layered structure in which a semi-insulating type cladding layer, a semiconductor optical waveguide core layer, and a semi-insulating type cladding layer are sequentially laminated on a substrate, said semiconductor optical modulator characterized in that

a part of at least one of the semi-insulating type cladding layers including a surface opposite from a laminated surface with the semiconductor optical waveguide core layer is an n-type cladding layer, or all of at least one of the semi-insulating type cladding layers is an n-type cladding layer.

15

2. The semiconductor optical modulator according to claim 1, characterized in that a waveguide structure is a high-mesa waveguide structure or a ridge waveguide structure.

3. The semiconductor optical modulator according to claim 1, characterized in that electrodes are respectively connected to the n-type cladding layer or the semi-insulating type cladding layer placed directly on the substrate and to the n-type cladding layer or the semi-insulating type cladding layer including a surface opposite from a laminated surface with the semiconductor optical waveguide core layer laminated on the substrate,

and voltage is applied.

4. The semiconductor optical modulator according to claim
3, characterized in that the electrode are configured to
5 be a coplanar waveguide line structure.

5. A semiconductor Mach-Zehnder type optical modulator
including the semiconductor optical modulator according
to any one of claims 1 to 4, an optical splitter by which
10 input light is split into two light beams, and an optical
coupler by which light beams modulated by the semiconductor
optical modulator are combined together.

6. A semiconductor optical modulator having a layered
15 structure in which an n-type cladding layer, an optical
waveguide core layer, and an n-type cladding layer are
sequentially laminated on a substrate, said semiconductor
optical modulator characterized in that

a semi-insulating type cladding layer is laminated
20 between at least one of the n-type cladding layers and the
optical waveguide core layer.

7. The semiconductor optical modulator according to claim
6, characterized in that a waveguide structure is a high-mesa
25 waveguide structure or a ridge waveguide structure.

8. The semiconductor optical modulator according to claim

6, characterized in that electrodes are respectively connected to the n-type cladding layer or the semi-insulating type cladding layer placed directly on the substrate and to the n-type cladding layer or the
5 semi-insulating type cladding layer including said opposite surface laminated on the substrate, and voltage is applied.

9. The semiconductor optical modulator according to claim 8, characterized in that the electrode are configured to
10 be a coplanar waveguide line structure.

10. A semiconductor Mach-Zehnder type optical modulator characterized by including the semiconductor optical modulator according to any one of claims 6 to 9, an optical
15 splitter by which input light is split into two light beams, and an optical coupler by which light beams modulated by the semiconductor optical modulator are combined together.